

Claims

1. A dry powder inhaler for delivering a dose of medicament for inhalation by a user, including a drug entrainment device and a valve actuable by a user to cause
5 pressurised gas to flow through a dose of medicament disposed in the drug entrainment device to entrain said dose in the gas, the valve comprising a valve member configured such that, in a first mode, pressurised gas biases the valve member into an open state to allow the flow of gas through the valve and, in a second mode, pressurised gas biases the valve member into a closed state to prevent
10 the flow of gas through the valve.
2. An inhaler according to claim 1, wherein the valve is configured such that pressurised gas acts over both sides of the valve member when it is in the closed state.
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3. An inhaler according to claim 2, wherein the valve is configured such that pressurised gas acts over a larger cross-sectional area of one side of the valve member than the pressurised gas acting over the other side of the valve member to keep the valve member in the closed state.
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4. An inhaler according to claim 3, wherein the valve is configured such that the pressure acting over each side of the valve member is substantially the same when the valve member is in the closed state.
- 25 5. An inhaler according to any preceding claim, wherein the valve is configured such that the valve member moves from the closed state to the open state in response to a change in pressure of the gas acting on one side of the valve member relative to the pressure acting on the other side of the valve member.
- 30 6. An inhaler according to any of claims 2 to 5, comprising a reservoir for pressurised gas and a valve orifice for the passage of pressurised gas from the reservoir through the drug entrainment device, a first side of the valve member forming a seal with the valve orifice when in the closed state such that pressurised

- 16 -

gas in said reservoir acts over only a portion of said first side of the valve member defined by the cross-sectional area of the valve orifice.

7. An inhaler according to claim 6, wherein the valve orifice is located at the mouth of a tube in communication with the reservoir, the tube including a valve seat at the end thereof for cooperation with said first side of the valve member to form a seal therewith when the valve member is in the closed state.

8. An inhaler according to claim 7, wherein the valve is configured such that when the seal between the first side of the valve member and the valve seat is broken, the pressure of the gas in the reservoir acts over substantially the entire surface of the first side of the valve member to bias the valve member into the open state.

9. An inhaler according to any of claims 6 to 8, comprising biasing means to bias the valve member into a closed state when the pressure of the gas in the reservoir has been discharged through the valve.

10. An inhaler according to any claim 10, wherein the biasing means comprises a spring.

11. An inhaler according to any preceding claim, wherein means are provided to discharge the pressure that biases the valve member into the closed state to cause the valve member to move from the closed to the open state.

12. An inhaler according to claim 11, wherein the valve includes a primary chamber in which pressure to bias the valve member into the closed state is generated and said means for discharging the pressure that biases the valve member into the closed state comprises a discharge port in the primary chamber.

13. An inhaler according to claim 12, including means for opening the discharge port to atmosphere.

- 17 -

14. An inhaler according to claim 13, wherein the means for opening the discharge port is breath actuated.

15. An inhaler according to claim 14, wherein the valve includes a secondary valve member which is movable, in response to inhalation by a user, from a first closed position in which the discharge port is not in communication with the primary chamber to prevent discharge of the primary chamber to the atmosphere, into a second open position in which the discharge port is in communication with the primary chamber to discharge the primary chamber to the atmosphere.

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16. An inhaler according to claim 15, wherein the secondary valve member is configured such that the pressure in the primary chamber acts over a smaller cross-sectional area of a first side of the secondary valve member than the cross-sectional area of the other side of the valve member over which atmospheric pressure acts, when the secondary valve member is in the closed position.

17. An inhaler according to claim 15 or claim 16, comprising biasing means to bias the secondary valve member into a closed state when the pressure of the gas in the primary chamber has discharged through the discharge port.

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18. An inhaler according to claim 17, wherein the biasing means comprises a spring.

19. An inhaler according to any of claims 15 to 17, wherein the valve is configured such that the secondary valve member is in the closed position, to prevent the discharge of pressure from the primary chamber to the atmosphere, when the pressure acting over each side of the secondary valve member is substantially the same.

20. An inhaler according to any of claims 15 to 19, wherein the secondary valve member is a flexible diaphragm.

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- 18 -

21. An inhaler according to any of claims 12 to 20, comprising means for charging the reservoir with pressurised gas or air.

22. An inhaler according to claim 21, wherein the means for charging the
5 reservoir is also operable to charge the primary chamber.

23. An inhaler according to claim 22, wherein a conduit communicates the reservoir with the primary chamber.

10 24. An inhaler according to any of claims 21 to 23, wherein the means for charging the reservoir is a piston pump, a multiple action pump charging an accumulator via a check valve, a canister of compressed gas or a canister of propellant such as HFA.

15 25. An inhaler according to any preceding claim, wherein the valve member is a flexible diaphragm.

26. An inhaler substantially as hereinbefore described with reference to Figures 2 to 9 of the accompanying drawings.

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